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Publication number:

0 150 293
A1

12

EUROPEAN PATENT APPLICATION

21 Application number: 84113776.3

51 Int. Cl.: G 11 B 7/24

22 Date of filing: 14.11.84

30 Priority: 15.11.83 JP 215754/83
21.02.84 JP 31788/84

43 Date of publication of application: 07.08.85
Bulletin 85/32

84 Designated Contracting States: DE FR GB IT NL

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54 Substrate for optical recording media.

57 A substrate for optical recording media, said substrate
being composed of a polyvinylacetal resin resulting from
acetalization of polyvinylalcohol to a degree of at least 60
mole% with at least one acetalizing agent selected from the
group consisting of aliphatic aldehydes, alicyclic aldehydes,
aromatic aldehydes and heterocyclic aldehydes.

EP 0 150 293 A1

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This invention relates to a substrate for use in optical recording media in which recording and reproduction of information are carried out by the reflection or transmission of laser beams. More specifically, the invention
5 relates to a substrate for optical recording media, which has excellent transparency, moisture resistance, moldability and heat resistance and being free from birefringence.

The optical recording media typically comprise a flat substrate and formed on at least one surface thereof,
10 rows of minute depressions, or helically or concentrically extending pre-grooves and a recording layer on the pre-grooves. Laser beams are focused on the minute depressions or the recording layer. The reflected or transmitted light is read and the information is reproduced.

15 Such optical recording media have been used as video discs, audio discs, document disc files, computer information disc files, etc. Generally, a poly(methyl methacrylate)-type resin or a polycarbonate-type resin is used as a substrate for the optical recording media because
20 of its requirement for transparency.

The poly(methyl methacrylate) resin has excellent moldability and strength, but inferior moisture resistance. At high temperatures and humidities, therefore, molded
25 articles from it undergo warping, or develop cracks while they repeatedly absorb moisture and dry. Moreover, their impact strength is reduced. Japanese Laid-Open Patent Publications Nos. 5354/1983 and 13652/1983 disclose resins having improved moisture resistance obtained by copolymerizing several kinds of monomers such as methacrylates,
30 styrene and cyclohexane methacrylate. However, so long as their major component is polymethacrylate, they have still unsatisfactory moisture resistance.

The polycarbonate-type resin, on the other hand,

has low surface hardness and is susceptible to injury. In addition, it has poor moldability, and because the orientation during molding remains in the molded articles, the articles have great birefringence, and therefore cannot be
5 used for large storage capacity image-type discs, large storage capacity document discs, and large storage capacity computer discs.

Other resins having excellent transparency have a high birefringence, and are unsuitable for use in such
10 discs.

It is an object of this invention therefore to provide a substrate for optical recording media, which eliminates the foresaid defects of the prior art, and can be used in optical discs of the large storage capacity
15 recording type.

Another object of this invention is to provide a substrate for optical recording media, which has excellent transparency, moldability and moisture resistance and is free from birefringence.

20 Still another object of this invention is to provide a substrate for optical recording media, which has excellent heat resistance.

According to this invention, there is provided a substrate for optical recording media, said substrate being
25 composed of a polyvinylacetal resin resulting from acetalization of polyvinylalcohol to a degree of at least 60 mole% with at least one acetalizing agent selected from the group consisting of aliphatic aldehydes, alicyclic aldehydes, aromatic aldehydes and heterocyclic aldehydes.

30 The present invention is based on the inventors' discovery that a resin having excellent moisture resistance can be obtained by increasing the degree of acetalization of a polyvinylacetal resin having high transparency, and that a resin having excellent heat resistance can be ob-
35 tained by selecting the type of an aldehyde to be used in acetalization.

The polyvinylacetal resin is obtained by acetalizing polyvinylalcohol with an aldehyde in the presence of an acid catalyst. If the degree of acetalization is low, the resulting polyvinylacetal resin has high hygroscopicity because of the remaining hydroxyl groups. The polyvinylacetal resin forming the substrate of this invention has excellent moisture resistance because it has a degree of acetalization of at least 60 mole%, preferably at least 65 mole%. To obtain such a polyvinylacetal resin, the starting polyvinylalcohol preferably has a high purity.

The polyvinylalcohol has a degree of saponification of at least 80 mole%, preferably at least 95 mole%. In other words, it has not more than 20 moles%, preferably not more than 5 mole%, of residual acetyl groups. If the percentage of the residual acetyl groups is high, the transparency of the resulting polyvinylacetal resin is undesirably reduced. The polyvinylalcohol has a degree of polymerization of 100 to 2,500, preferably 300 to 1,500. If its degree of polymerization is below 100, the resulting polyvinylacetal resin has drastically reduced impact strength and cannot withstand practical use. Furthermore, its heat resistance and moisture resistance tend to be degraded. If, on the other hand, its degree of polymerization exceeds 2,500, an injection-molded article prepared from the resulting polyvinylacetal resin undesirably has great birefringence.

Primarily, an aliphatic aldehyde is used as an acetalizing agent for the polyvinylalcohol. To increase the heat resistance of the polyvinylacetal resin further, an alicyclic aldehyde, an aromatic aldehyde or a heterocyclic aldehyde is used as part or the whole of the acetalizing agent.

Examples of the aliphatic aldehydes include formaldehyde, acetaldehyde, propylaldehyde, n-butylaldehyde, isobutylaldehyde, decylaldehyde, and dodecylaldehyde. These aldehydes may be used singly or in combination.

Examples of the alicyclic aldehydes include saturated aldehydes such as cyclohexanealdehyde, trimethylcyclohexanealdehyde, dimethylcyclohexanealdehyde, methylcyclohexanealdehyde, cyclopentanealdehyde, methylcyclopentanealdehyde, decahydro-beta-naphthaldehyde and cyclohexaneacetaldehyde; terpene-type aldehydes such as alpha-camphorenealdehyde, phellandral, cyclocitral, trimethyltetrahydrobenzaldehyde, alpha-pyrronenealdehyde, myrtenal, dihydromyrtanal and camphenilanealdehyde; and unsaturated aldehydes such as 4-methylcyclohexenealdehyde and 3-methylcyclohexenealdehyde.

Examples of the aromatic aldehyde include benzaldehyde, phenylacetaldehyde, phenylpropylaldehyde, tolu-aldehyde, dimethylbenzaldehyde, cumenealdehyde, and naphthylaldehyde.

Examples of the heterocyclic aldehydes are aldehydes having a furane ring such as furfural and 5-methylfurfural.

The above alicyclic, aromatic and heterocyclic aldehydes may respectively be used singly or in combination.

When the alicyclic, aromatic or heterocyclic aldehyde is used as the acetalizing agent, it should be added in an amount sufficient to acetalize at least 5 mole% of the polyvinylalcohol. If it is less than 5 mole%, sufficient heat resistance cannot be obtained. The acetalizing agent may be composed only of the alicyclic, aromatic or heterocyclic aldehyde.

The polyvinylacetal resin may be prepared by an ordinary method such as the dissolving method, the homogeneous method or the precipitation method. Or it may be prepared by saponifying polyvinylacetate and subsequently acetalizing the resulting product.

The polyvinylacetal resin so prepared is molded by ordinary methods such as injection molding or compression molding. As required, ordinary additives such as age

resistors, antioxidants, heat stabilizers, ultraviolet absorbers and lubricants may be used in the molding process.

Since the substrate in accordance with this invention is composed of the polyvinylacetal resin having such a high degree of acetalization, it has excellent moisture resistance, and therefore does not undergo warpage or strain during storage. Furthermore, because the resin has excellent moldability, fine pits of a stamper and pre-grooves can be reproduced, and the strain or orientation during molding does not remain. For this reason, erroneous recording or reading of information does not occur. The substrate of this invention is applicable to a wide range of optical recording media including large storage capacity image-type discs, large storage document discs, and large storage capacity computer discs.

The use of the alicyclic, aromatic or heterocyclic aldehyde for the acetalization brings about the advantage that the substrate obtained also has excellent heat resistance.

The following examples illustrate the present invention more specifically.

EXAMPLE 1

(A) Preparation of polyvinylacetal

One hundred grams of polyvinylalcohol having a degree of saponification of 99.2 mole% and a degree of polymerization of 2,200 was dissolved in 880 g of distilled water, and 57 g of concentrated hydrochloric acid was added. While the mixture was maintained at 14.4°C, 57.3 g of isobutylaldehyde was added dropwise over 15 minutes. Ten minutes after the addition, polyvinylbutyral precipitated. This reaction system was heated and maintained at 40°C for 10 hours. The temperature was then lowered, and it was neutralized with sodium bicarbonate. The resulting polyvinylbutyral was washed with water, and dried at 70°C for 48 hours. The degree of acetalization of this resin was measured.

(B) Molding of the polyvinylacetal resin and evaluation of its properties

The resin obtained as described in section (A) was injection-molded at a cylinder temperature of 195°C and a molding temperature of 60°C. The warpage after water absorption, percentage water absorption, total light transmittance, haze value and birefringence of the resulting injection-molded plate (1.2 mm x 120 mm x 120 mm) were measured by the methods shown below.

10 The results obtained in Examples 1 to 8 and Comparative Example 1 are summarized in Table 1.

(1) Warpage after water absorption

Aluminum was vapor deposited on one surface of the molded plate, and a protective coating was further applied to shut off intrusion of water from the vapor-deposited layer. This sample was immersed in water at 20°C, and its warpage at the central portion was measured 72 hours later.

(2) Water absorption

20 The molded plate not subjected to the vapor deposition treatment was immersed in water at 20°C, and the weight of the sample after 72 hours was measured. The percentage of an increase in weight was calculated.

(3) Total light transmittance

25 Measured in accordance with the method of ASTM D-1003.

(4) Haze value

Measured in accordance with the method of ASTM D-1003.

30 (5) Presence or absence of birefringence

The molded plate not subjected to the vapor deposition treatment was interposed between two polarizing plates. Visible light was transmitted through it, and the presence or absence of birefringence was examined by observing the interference fringe.

35

(6) Degree of acetalization

Measured in accordance with JIS K-6728, 5.5.2.

The same method was used in Examples 2, 6, 8, 16 and 17 in which the acetalization was effected by using a single
5 aldehyde.

When two or more aldehydes were used as in Examples 3 to 5, 7, 9 to 15 and 18, the aldehydes were treated with hydroxylamine hydrochloride to convert them to the corresponding oximes which were quantitatively deter-
10 mined by gas chromatography in accordance with JIS K-6728, 5.5.2. The operating conditions for gas chromatography were as follows:-

Gas chromatographic device: GC6AM made by Shimadzu
Seisaku Sho, K.K.
15 (FID method)

Column: PEG 6000

Column temperature: 100-180°C, fixed temperature
method (temperatures at which two
oximes can be separated differ)

20 Carrier gas: nitrogen

Flame gas: hydrogen/air

EXAMPLE 2

Example 1 was repeated except that 69.5 g of isobutylaldehyde was used, and the degree of saponification
25 of the polyvinylalcohol was 99.4%.

EXAMPLE 3

Example 1 was repeated except that the degree of saponification of the polyvinylalcohol was 99.6%, and instead of isobutylaldehyde, 53.1 g of n-butylaldehyde and
30 6.8 g of formaldehyde were used.

EXAMPLE 4

Example 1 was repeated except that the degree of saponification of the polyvinylalcohol was 98.8%, and instead of isobutylaldehyde, 33.5 g of n-butylaldehyde and
35 29.9 g of acetaldehyde were used.

EXAMPLE 5

Example 1 was repeated except that the degree of saponification of the polyvinylalcohol was 98.8%, and instead of isobutylaldehyde, 34.9 g of acetaldehyde and
5 35.7 g of 2-ethylhexylaldehyde was used.

COMPARATIVE EXAMPLE 1

Poly(methyl methacrylate) resin (PARAPET F1000, a product of Kyowa Gas Chemical Co., Ltd.) generally used for an optical disc was molded and evaluated in the same way as
10 in Example 1.

Table 1

Ex- ample	Polyvinylalcohol		Aldehyde	Degree of acetal- ization (mole%)	Properties of the molded article				
	D. P.	Amount of residual acetyl groups (mole%)			Warpage (mm)	Water absorp- tion (%)	Total light trans- mittance (%)	Haze value	Biref- ringence
1	2200	0.8	Isobutylaldehyde	69.5	0.6	0.8	92.3	0.6	None
2	2200	0.6	Isobutylaldehyde	78.4	0.3	0.5	92.8	0.6	None
3	2200	0.4	n-Butylaldehyde	62.0	0.4	0.7	91.7	0.8	None
			Formaldehyde	12.0					
4	2200	1.2	n-Butylaldehyde	40.0	0.5	0.6	92.4	0.6	None
			Acetaldehyde	42.0					
5	2200	1.2	Acetaldehyde	60.0	0.6	0.5	92.4	0.6	None
			2-Ethylhexylaldehyde	21.0					

- to be continued -

Table 1 (continued)

Ex-ample	Polyvinylalcohol		Degree of acetalization (mole%)	Properties of the molded article				
	D. P.	Amount of residual acetyl groups (mole%)		Warpage (mm)	Water absorption (%)	Total light transmittance (%)	Haze value	Birefringence
6	500	0.95	69.1	0.7	0.8	92.1	0.4	None
7	500	0.95	30.2	0.5	0.6	92.2	0.7	None
			31.0					
8	500	0.95	60.5	0.4	0.5	92.4	0.8	None
Comp. Ex. 1	-	-	-	2.1	1.2	91.9	0.8	None

- 11 -

EXAMPLE 6

Example 1 was repeated except that polyvinyl-
alcohol having a degree of polymerization of 500 and con-
taining 0.95% of residual acetyl groups was used instead of
5 the polyvinylalcohol used in Example 1.

EXAMPLE 7

Example 1 was repeated except that the polyvinyl-
alcohol used in Example 6 was used, and 28 g of isobutyl-
aldehyde and 35.8 g of 2-ethylhexylaldehyde were used
10 instead of 57.3 g of isobutylaldehyde.

EXAMPLE 8

Example 1 was repeated except that the polyvinyl-
alcohol used in Example 6 was used, and instead of isobutyl-
aldehyde, 61.5 g of trimethylacetaldehyde was used.

15

EXAMPLE 9

(A) Preparation of polyvinylacetal

One hundred grams of polyvinylalcohol having a
degree of saponification of 99.2 mole% and a degree of
polymerization of 1,500 was dissolved in 880 g of distilled
20 water. Concentrated hydrochloric acid (57 g) was added,
and while the mixture was maintained at 14.4°C, 28.8 g of
isobutylaldehyde was added dropwise over 15 minutes. Ten
minutes after the addition, a precipitate of polyvinyl-
butyral formed. Cyclohexanealdehyde (63.5 g) was further
25 added, and the reaction mixture was heated and maintained
at 40°C for 10 hours. The temperature was then lowered,
and the reaction mixture was neutralized with sodium bi-
carbonate. The resulting polyvinylacetal was washed with
water, and dried at 70°C for 48 hours.

30 (B) Molding of polyvinylacetal and evaluation of its
properties

The resin obtained in (A) was injection-molded at
a cylinder temperature of 255°C and a die temperature of
75°C. The warpage after water absorption, percent water
35 absorption, total light transmittance, haze value, biref-
ringence and heat distortion temperature of the resulting

injection molded plate (1.2 mm x 120 mm x 120 mm in size) were measured.

The results obtained in Examples 9 to 14 and Comparative Examples 2 and 3 are summarized in Table 2.

- 5 The heat distortion temperature was measured by the method of ASTM D-648 (18.6 kg/cm²), and the other properties were measured in the same way as in Example 1.

EXAMPLE 10

(A) Preparation of polyvinylacetal

- 10 One hundred grams of polyvinylalcohol having a degree of saponification of 99.2 mole% and a degree of polymerization of 1,500 was dispersed in a mixture of 100 g of distilled water and 700 g of isopropanol. Concentrated hydrochloric acid (57 g) was added. With stirring at 65°C, 15 28.8 g of isobutylaldehyde and 95.8 g of 2,2,6-trimethylcyclohexanealdehyde were added. The mixture was maintained at 65°C for 15 hours. The reaction mixture was neutralized, and then a large amount of water was added to precipitate the resin. The resulting polyvinylacetal resin 20 was washed with water, and dried at 70°C for 48 hours.

(B) Molding of the polyvinylacetal resin, and the evaluation of its properties were carried out in the same way as in Example 9.

EXAMPLE 11

- 25 (A) Preparation of polyvinylacetal

Example 1 was repeated except that 86.2 g of phellandral was added instead of the cyclohexanealdehyde.

- (B) Molding of the polyvinylacetal resin and the evaluation of its properties were carried out in the same 30 way as in Example 9.

EXAMPLE 12

- (A) Preparation of polyvinylacetal

Example 9 was repeated except that the amount of isobutylaldehyde was changed to 61.3 g, and the amount of 35 cyclohexanealdehyde was changed to 12.7 g.

- (B) Molding of the polyvinylacetal resin and the

evaluation of its properties were carried out in the same way as in Example 9.

EXAMPLE 13

(A) Preparation of polyvinylacetal

5 Example 1 was repeated except that 54.4 g of benzaldehyde was used instead of cyclohexanealdehyde.

(B) Molding of the polyvinylacetal and the evaluation of its properties were carried out in the same way as in Example 9.

EXAMPLE 14

10 (A) Preparation of polyvinylacetal

Example 9 was repeated except that the amount of isobutylaldehyde was changed to 61.3 g, and 21.8 g of furfural was used instead of the cyclohexanealdehyde.

15 (B) Molding of the polyvinylacetal and the evaluation of its properties were carried out in the same way as in Example 9.

COMPARATIVE EXAMPLE 2

(A) Preparation of polyvinylacetal

20 Example 9 was repeated except that the amount of isobutylaldehyde was changed to 57.3 g, and the cyclohexanealdehyde was not used.

(B) Molding of the polyvinylacetal and the evaluation of its properties were carried out in the same way as in
25 Example 9.

COMPARATIVE EXAMPLE 3

Poly(methyl methacrylate) resin (PARAPET F1000, a product of Kyowa Gas Chemical Co., Ltd.) generally used for an optical disc was molded and evaluated in the same way as
30 in Example 9.

Table 2

Ex- ample	Aldehyde	Degree of acetal- ization (mole%)	Properties of the molded article					
			Warpage (mm)	Water absorp- tion (%)	Total light trans- mittance (%)	Haze value	Biref- ringence	Heat distortion temperature (°C)
9	Isobutylaldehyde	35	0.4	0.6	92.3	0.9	None	83
	Cyclohexanealdehyde	50						
10	Isobutylaldehyde	35	0.2	0.3	92.4	1.0	None	91
	2,2,6-Trimethyl cyclohexanealdehyde	50						
11	Isobutylaldehyde	35	0.2	0.3	92.6	0.8	None	84
	Phellandral	50						
12	Isobutylaldehyde	75	0.6	0.5	92.8	0.9	None	74
	Cyclohexanealdehyde	10						

- to be continued -

Table 2 (continued)

Ex-ample	Aldehyde	Degree of acetalization (mole%)	Properties of the molded article					
			Warpage (mm)	Water absorption (%)	Total light transmittance (%)	Haze value	Birefringence	Heat distortion temperature (°C)
13	Isobutylaldehyde	35	0.5	0.5	91.8	1.1	None	78
	Benzaldehyde	50						
14	Isobutylaldehyde	75	0.6	0.6	92.4	0.8	None	73
	Furfural	10						
Comp. Ex. 2	Isobutylaldehyde	-	0.6	0.8	92.3	0.6	None	61
Comp. Ex. 3	-	-	2.1	1.2	91.9	0.8	None	82

EXAMPLE 15

(A) Preparation of polyvinylacetal

Example 9 was repeated except that polyvinyl-
alcohol having a degree of polymerization of 500 and a
5 degree of saponification of 99.2 mole% was used.

(B) Molding of the polyvinylacetal and evaluation of
its properties were carried out in the same way as in
Example 9.

10 The results obtained in Examples 15 to 18 are
summarized in Table 3.

EXAMPLE 16

(A) Preparation of polyvinylacetal

Example 9 was repeated except that the same
polyvinylalcohol as used in Example 15 was used, and 90 g
15 of cyclohexanealdehyde was used instead of the isobutyl-
aldehyde.

(B) Molding of the polyvinylacetal and the evaluation
of its properties were carried out in the same way as in
Example 9.

20

EXAMPLE 17

(A) Preparation of polyvinylacetal

Example 9 was repeated except that polyvinyl-
alcohol having a degree of polymerization of 800 and a
degree of saponification of 99.5 mole% was used, and 101 g
25 of 3-methylcyclohexanealdehyde was used instead of isobutyl-
aldehyde.

(B) Molding of the polyvinylacetal and the evaluation
of its properties were carried out in the same way as in
Example 9.

30

EXAMPLE 18

(A) Preparation of polyvinylacetal

Example 9 was repeated except that 45 g of cyclo-
hexanealdehyde and 51 g of 3-methylcyclohexanealdehyde were
used instead of isobutylaldehyde.

35

(B) Molding of the polyvinylacetal resin and the
evaluation of its properties were carried out in the same
way as in Example 9.

Ex-ample	Polyvinylalcohol		Aldehyde	Degree of acetalization (mole%)	Properties of the molded article					
	D. P.	Amount of residual acetyl groups (mole%)			Warpage (mm)	Water absorption (%)	Total light transmittance (%)	Haze value	Birefringence	Heat distortion temperature (°C)
15	500	99.2	Isobutylaldehyde	34	0.7	0.6	91.1	0.6	None	81
			Cyclohexanealdehyde	49						
16	500	99.2	Cyclohexanealdehyde	61	0.5	0.9	90.2	0.9	None	86
17	800	99.5	3-Methylcyclohexanealdehyde	61.5	0.5	0.8	91.2	1.0	None	82
18	800	99.5	3-Methylcyclohexanealdehyde	30.5	0.5	0.8	91.4	1.1	None	84
			Cyclohexanealdehyde	31						

What is claimed is:

1. A substrate for optical recording media, said substrate being composed of a polyvinylacetal resin resulting from acetalization of polyvinylalcohol to a degree of at least 60 mole% with at least one acetalizing agent selected from the group consisting of aliphatic aldehydes, alicyclic aldehydes, aromatic aldehydes and heterocyclic aldehydes.
2. The substrate of claim 1 wherein the polyvinylalcohol has a degree of polymerization of 100 to 2,500.
3. The substrate of claim 1 wherein the polyvinylalcohol has a degree of saponification of at least 95 mole%.
4. The substrate of claim 1 wherein the acetalizing agent is an aliphatic aldehyde.
5. The substrate of claim 1 wherein the acetalizing agent is at least one compound selected from the group consisting of alicyclic aldehydes, aromatic aldehydes and heterocyclic aldehydes.
6. The substrate of claim 1 wherein at least 5 mole% of the polyvinylalcohol is acetalized with at least one acetalizing agent selected from the group consisting of alicyclic aldehydes, aromatic aldehydes and heterocyclic aldehydes, and the rest is acetalized with an aliphatic aldehyde to such a degree that the total degree of acetalization is at least 60 mole%.
7. The substrate of claim 1, 4 or 6 wherein the aliphatic aldehydes are selected from the group consisting of formaldehyde, acetaldehyde, propylaldehyde, n-butylaldehyde, isobutylaldehyde, decylaldehyde and dodecylaldehyde.
8. The substrate of claim 1, 5 or 6 wherein the alicyclic aldehydes are selected from the group consisting of saturated aldehydes such as cyclohexanealdehyde, trimethylcyclohexanealdehyde, dimethylcyclohexanealdehyde, methylcyclohexanealdehyde, cyclopentanealdehyde,

methylcyclopentanealdehyde, decahydro-beta-naphthaldehyde and cyclohexaneacetaldehyde; terpene-type aldehydes such as alpha-camphorenealdehyde, phellandral, cyclocitral, trimethyltetrahydrobenzaldehyde, alpha-pyronealdehyde, myrtenal, dihydromyrtanal and camphenilanealdehyde; and unsaturated aldehydes such as 4-methylcyclohexenealdehyde and 3-methylcyclohexenealdehyde.

9. The substrate of claim 1, 5 or 6 wherein the aromatic aldehydes are selected from the group consisting of benzaldehyde, phenylacetaldehyde, phenylpropylaldehyde, tolualdehyde, dimethylbenzaldehyde, cumenealdehyde, and naphthylaldehyde.

10. The substrate of claim 1, 5 or 6 wherein the heterocyclic aldehydes are selected from aldehydes having a furane ring.



European Patent
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EUROPEAN SEARCH REPORT

0150293

EP 84 11 3776

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	FR-A-2 466 830 (OMEX) * Page 12, lines 5-24; example 5; figure 2 *	1,2,4,7	G 11 B 7/24
Y	US-A-3 926 918 (SHIBATA et al.) * Abstract; column 2, lines 12-55 *	1,2,4,7	
A	PATENT ABSTRACTS OF JAPAN, vol. 4, no. 2, 9th January 1980, page 102 C 69 (C69; & JP-A-54-138091 (SEKISUI K.K.) 26-10-1979	1-3,6	
A	PATENT ABSTRACTS OF JAPAN, vol. 5, no. 152, 25 th September 1981, (C-73)(824); & JP-A-56-82806 (SEKIISUI K.K.) 06-07-1981	1-3	
A	GB-A-1 382 547 (E.C. CHEMICAL INDUSTRIES) * Page 1, line 79 - page 2, line 32 *	9	TECHNICAL FIELDS SEARCHED (Int. Cl.4) C 08 F 8/00 C 08 F 216/00 C 08 L 59/00 G 11 B 7/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 04-02-1985	Examiner WIBERGH S.R.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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 A : technological background
 O : non-written disclosure
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T : theory or principle underlying the invention
 E : earlier patent document, but published on, or after the filing date
 D : document cited in the application
 L : document cited for other reasons
 & : member of the same patent family, corresponding document



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	PHILIPS TECHNICAL REVIEW, vol. 40, no. 10, 1982, Eindhoven, NL; H.C.H. VAN RIJSEWIJK et al. "Manufacture of Laser vision video discs by a photopolymerization process", pages 287-297 * Page 293 "choice of substrate" * -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 04-02-1985	Examiner WIBERGH S.R.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	